

The conscious city: Traffic congestion and change toward sustainability in metro Vancouver

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Résumé de l'article

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THE CONSCIOUS CITY: TRAFFIC CONGESTION AND CHANGE TOWARD SUSTAINABILITY IN METRO VANCOUVER

Graham SENFT

❶ RÉSUMÉ

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MOTS-CLÉS ■ Congestion routière, durabilité urbaine, conscience sociale, changement



❶ ABSTRACT

Using inductive, grounded theory research, this article explores the relationship between traffic congestion and change toward sustainability in Metro Vancouver through document analysis and nineteen elite interviews. The research finds that traffic congestion can be a powerful force for change, subject to the two distinct mental models that shape perspectives, behavior, and public debate in the region. The models break down mainly along urban and suburban boundaries, creating a major split in the region and significant variation in public discourse. The paper concludes that progress toward sustainability will depend, in part, on the mental model of the region's dominant actors.

KEYWORDS ■ Congestion, sustainability, social consciousness, change

I. TRAFFIC CONGESTION AND CHANGE TOWARD SUSTAINABILITY

The issue of traffic congestion has been the subject of a great deal of study in recent years. However, congestion research, like transportation research more broadly, has traditionally been quantitative in nature, and dominated by applied research and engineering-based approaches. In this context, the economic costs of congestion have been well documented and strategies for congestion mitigation have received considerable attention. However, comparatively little work has been done on the social and behavioural implications of congestion. More specifically, there is very little research that seeks to understand the role of congestion in terms of change toward sustainability in cities.

Traffic congestion is unique among problems associated with urban development. Other significant urban social problems, such as homelessness and drug addiction, do not affect as broad a spectrum of citizens as congestion does. Given its ongoing, pervasive impact on urban residents, traffic congestion—both real and perceived—is an important political issue in many cities (Gordon, 2007; Sandalack and Dewald, 2007; Jonas, 2006). As such, traffic congestion, and the debate around traffic congestion, has the potential to be an important catalyst for change, and may have a role to play in the evolution of public discourse on urban sustainability, specifically through the development of an increased consciousness around how we build our cities and organize our lives within them.

A sustainable city is defined by the International Centre for Sustainable Cities as one that “enhances and integrates the economic, social, cultural and environmental well being of current and future generations” (ICSC¹, 2006). Understanding change toward sustainability in cities requires consideration of social and behavioral norms in the urban context. Traditional social norms in North America place an overarching emphasis on consumption, individual rights, and unrestricted growth; change toward sustainability will require shifting these norms through the development of a collective consciousness of the fundamental relationships that underlie environmental, economic, and social issues (Edwards, 2005; Meyer, 2007). This shift has been characterized as a social consciousness of sustainability², defined for the

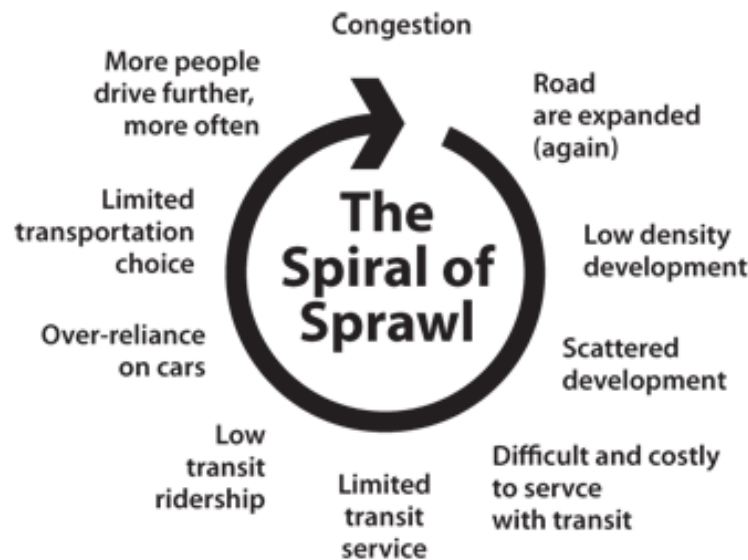
purposes of this research as a collective sense of, and responsiveness to, challenges and obligations associated with sustainability, independent of formal government, business and professional institutions (Holt, 2007). Social consciousness therefore, is an integral part of change toward sustainability. Recent contributions to the literature have added to the discourse on social consciousness in the urban context. In his book *Dream City: Vancouver and the Global Imagination*, Berelowitz explores the link between Vancouver’s dramatic setting, it’s emerging culture of planning and design, and the distinct “moral sensibilities” of those who live there (2005), while in *Concrete Reveries: Consciousness and the City*, Kingwell provides an analysis of the relationship between the city and personal identity, illustrating the influence of urban landscapes and the built form of the city on the values and political consciousness of its residents (2008). Behavioral norms and social consciousness are particularly relevant in the field of sustainable transportation. In their work on transport and social change, Black and Nijkamp make the case for interdisciplinary research that “highlights the contribution of the social, economic, and behavioral sciences to the theoretical and methodological development of research in the transport field” (2002).

In this vein, this article explores the relationship between traffic congestion, social consciousness, and change toward sustainability. How will congestion foster the kind of behavioral and institutional change that will foster change toward sustainability? What conditions are necessary for this to happen? What level of congestion will be required for developers, employers, and commuters to change their current behavior? Gaps in the literature raise these and other important questions, some of which will be addressed in this article.

Admittedly, there is much more familiarity with the traditional transportation planning paradigm, in which congestion is viewed as a supply “problem” with a technical “solution”. As illustrated by Figure 1, congestion is traditionally addressed through capacity expansion, which leads to additional low-density development, limiting the effectiveness of transit and the attractiveness of other transportation alternatives. This approach ultimately leads to an auto-dependent transportation system in which travel distance and frequency increases, eventually leading to more congestion. In this context, traffic congestion feeds the “spiral of sprawl”, and reinforces and expands the auto-oriented status quo.

¹ International Centre for Sustainable Cities

² Although the concept of social consciousness could be used to assess a wide range of trends, this paper uses the term to refer exclusively to ‘social consciousness of sustainability’, as per the definition above.



(Source: City of Burnaby, 2006)

Fig. 1 – The Spiral of Sprawl

This article explores the potential for traffic congestion to break the 'spiral of sprawl', and challenge the outcome of the traditional transport planning paradigm by acting as a catalyst for change toward sustainability. More specifically, the article proposes that traffic congestion has contributed significantly to a social consciousness in the Greater Vancouver region that supports the principles of sustainability.

The article is based largely on research interviews conducted with 19 individuals active in the Vancouver region's transportation and sustainability policy networks, including elected officials, policy experts, journalists, transportation and land use planners, transportation consultants, and representatives of business and industry associations.

2. TRAFFIC CONGESTION AND METRO VANCOUVER

There are a number of factors that make Metro Vancouver well suited to a study of traffic congestion as it relates to change toward sustainability. First and foremost, transportation in general, and traffic congestion in particular, are of critical importance to residents of the region; transportation and traffic congestion are the focus of much public debate and dialogue. Second, both the City of Vancouver and the

Greater Vancouver Regional District (GVRD, known commonly as Metro Vancouver), are widely recognized for their progressive planning efforts, including the pursuit of a balanced transportation system and the integration of land use and transportation planning. Finally, the Vancouver region has a reputation for its social consciousness and leadership on sustainability issues, illustrated by achievement in a number of key areas.

Traffic congestion is a very topical issue for the region. Greater Vancouver's transportation debate, of which congestion is a core element, is a divisive one. It has pitted driver against bus rider, homeowner against apartment dweller, and suburbanite against urban resident. Indeed, the provincial government's proposal to invest \$3 billion dollars in a new Fraser River crossing and several other regional highway projects (BC Ministry of Transportation, 2006) has galvanized the public, fueling the ongoing debate over traffic congestion and transportation planning in the region (Nagel, 2006; Boei and Simpson, 2006). The project is intended to "address congestion" in the Highway 1 corridor, specifically on the Port Mann Bridge, which is the most congested bottleneck in the region. The bridge serves 65 percent more traffic now than in 1985, an increase of more than 50,000 vehicles on a given day (BC Ministry of Transportation, 2006).

The road building approach of the current provincial government, as illustrated by the proposed Gateway Program, contrasts sharply with the "livability agenda" that has dominated past planning practice and current policy in the Vancouver region. The region has a long history of progressive planning, particularly in the City of Vancouver and at Metro Vancouver, beginning with the "Great Freeway Debate" of 1967. Widespread public opposition, led by inner city residents, defeated a proposed freeway project through their communities and into downtown Vancouver (Gutstein, 1975; Hasson and Ley, 1994). The debate was a pivotal moment in regional development, and marked a new era in Vancouver city politics.

At the regional level, Metro Vancouver serves as the metropolitan government for the twenty-one municipalities that make up the Vancouver region. While Metro does not have formal legislative authority for regional planning, it plays a very important role in shaping regional growth and development. In their assessment of the evolution and role of regional government in the region, Artibise, Cameron and Seelig note that Metro operates in an environment where land use planning is dominated by the municipal level, while transportation is dominated by the province (2004). However, they also argue that despite a lack of formal power, Metro has developed significant policy influence in its regional planning function (*ibid*). Since its creation in the late 1960s, Metro Vancouver has used its influence to make livability a key regional objective. Through a series of regional growth management strategies—most recently the 1996 Livable Region Strategic Plan and the 2007 Sustainable Region Initiative—Metro has attempted to contain sprawl and support regional transportation alternatives.

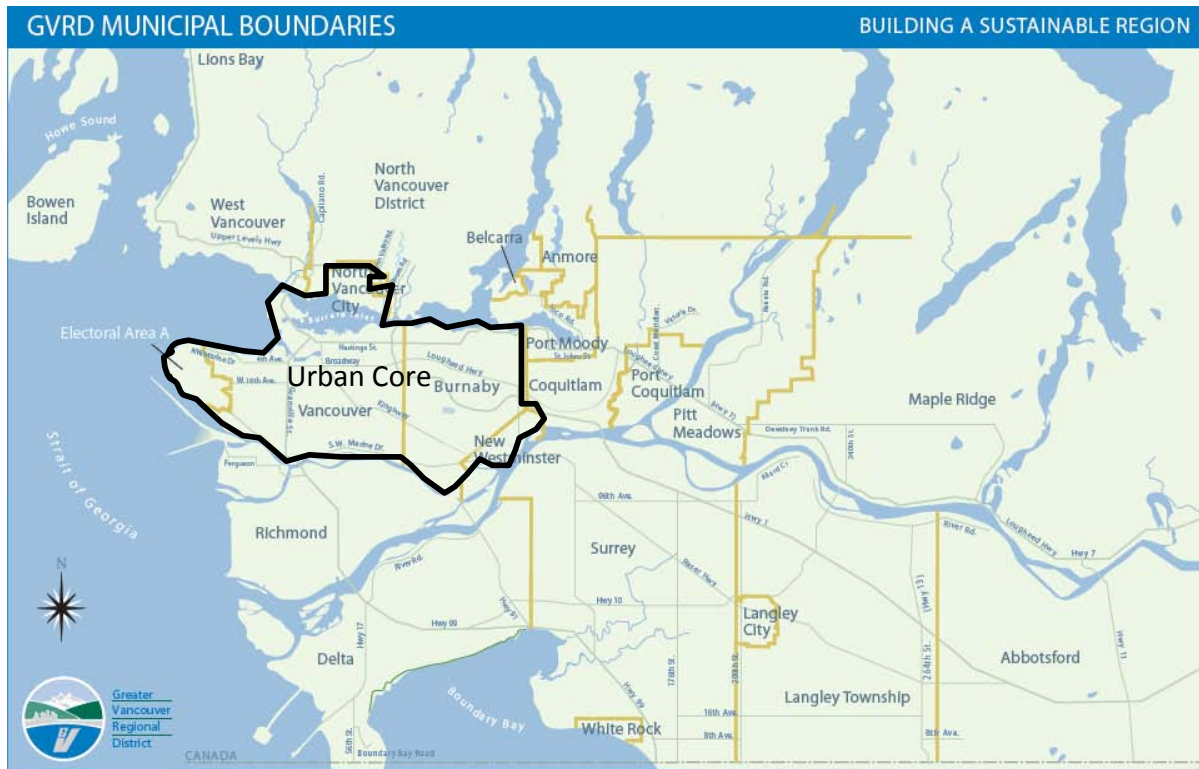
3. HOW DOES TRAFFIC CONGESTION INFLUENCE INDIVIDUAL BEHAVIOUR?

The research interviews focused on the aggregate travel choices and behaviour of Greater Vancouver residents, rather than on the preferences of individual interview subjects. As an expert informant, each interview subject provided a unique perspective that was used to establish a profile for individual resident categories in the region. A number of categories were identified, including urban, suburban, commuter, non-commuter, parent, non-parent, and so on. The assessment of individual behaviour within the region is based on these types. While the data were mixed, a number of respondents across categories saw traffic

congestion as a significant influence on individual behavior with respect to transportation, housing, and employment choices.

The most significant emergent theme in the data was the difference in the perceived perspectives of residents in different parts of the region. Several respondents, including a policy analyst with an alternative transportation NGO, a municipal transportation planner, and a senior executive with TransLink (the regional transportation authority), frequently and consistently identified differences in perspectives among residents of the urban core and residents of the surrounding suburban municipalities. The majority of respondents identified the urban core as the cities of Vancouver, North Vancouver, Burnaby, and New Westminster (see Figure 2). Many respondents, including a number of academics, an urban affairs journalist, an urban mayor, and a transport policy analyst, felt that congestion was a major factor in determining behaviour, but indicated that this was much more likely to be true in the urban core than in the suburbs. Conflicting regional perspectives emerged as a major theme throughout the interviews.

Respondents continually identified transportation alternatives, housing choice, and family demographics as important factors contributing to distinct perspectives among urban and suburban residents. Collectively, these factors form a framework for the development of a social consciousness of sustainability within different parts of the region. First, the availability of alternative transportation options was an important theme. Interviewees across categories consistently noted that quality transportation alternatives are critical to behavioral change: that is, congestion is more likely to encourage people to leave their car at home in the context of convenient and consistent access to transportation alternatives. Many respondents, including transportation planners, representatives of regional business associations, the urban affairs journalist, and a transport policy analyst, stressed the significance of disparities in the region's alternative transportation infrastructure and the divergent transportation patterns that occur as a result. For example, they noted that while the majority of trips in the core are made by single occupant vehicle, density is increasing, car ownership is decreasing, and transportation alternatives are gaining mode share. The same respondents contrasted this scenario with the experience in the suburbs, where auto-oriented development is dominant, auto ownership is increasing, and densities are not generally high enough to make transit attractive.



(GVRD 2007)

Fig. 2 – Metro Vancouver Municipalities

Second, housing choice emerged as an important theme related to traffic congestion and behavior. Housing choice is directly related to the availability of transportation alternatives. Generally speaking, the data suggest that people feel there are more transportation options available in older, higher-density neighborhoods within the urban core. The majority of respondents noted the significant role of housing price in determining where people live and how they travel. A senior official with a regional real estate organization noted that most people would prefer to live closer to the core, but cannot afford to do so. More importantly, according to several academics with expertise in geography and transportation issues, people don't feel they can afford to live closer: "perception of housing price is more important than actual price, because people underestimate what they could save by reducing their transportation costs". Respondents consistently indicated that housing choice was influenced more by cost than by commute time: The mayor of one urban municipality noted that "people still live the single-family suburban dream. They still want single-family

homes on the cul-de-sac, and that's their view, and they will sacrifice an hour's commute time, easily, everyday".

Conversely, the urban affairs journalist and the head of a provincial NGO working on sustainable land use issues firmly refuted the primacy of housing affordability. The NGO representative argued that "housing affordability issues are not as significant as people would like to think, it is a false assumption that you have to own, it is more about choice and trade offs".

The subject of housing choice highlighted a striking contrast in perspective amongst interview subjects. The data illustrated a significant relationship between family structure and housing choice and housing tenure, which may help explain the different perspectives above. The data on housing tenure highlight the economic element of the debate. The majority of single-family homes in suburban municipalities are owner occupied, representing a substantial investment in the suburban system on the

part of the individual owner, and a massive investment by suburban residents overall. Many suburban residents are structurally dependent on the suburban system—physically, economically, and socially. This has clear implications for the development of social consciousness.

Finally, the connection between demographic factors and housing choice was a strong, recurrent theme. A number of respondents suggested that at the broadest level, the urban core tends to attract a resident category comprised primarily of families without school age children, young professionals, students, and retired people (empty nesters). A transportation planner for a suburban municipality argued that suburbs, on the other hand, tend to attract a different type of resident, that is, families with children. Many respondents, including representatives of business associations and suburban planners, noted that many families feel they must choose between affordable ground-oriented housing in the suburbs (generally auto-dependent), and expensive and/or non-ground-oriented housing in a more central (but often transit-accessible) location. In this context, the suburban transportation planner notes that families will always exercise a preference for ground-oriented or detached housing over a shorter commute:

Most young families are looking for options in more walkable areas... they're looking at town centers, but most of our town centers don't have [the kind of environment they want] to raise kids, with tree lined streets, lovely parks and playgrounds... we're not developing areas that are transit oriented that are really to a high urban quality that would attract [families].

A suburban transportation planner and a professor of urban geography pointed out the potential for exceptions and variation within the urban-suburban resident categories: "obviously each individual will have a different threshold at which they will alter their behavior in response to congestion – for some, this may be a ninety minute commute, for others, it may be twenty minutes". Indeed, the senior official from a regional real estate organization argued that for many suburban residents, congestion plays a role in the decision to work closer to home (to avoid travel to the core or to a distant municipality, particularly if it requires crossing a bridge), suggesting a level of sensitivity to traffic congestion even in suburban environments without good transportation choice.

4. HOW HAS TRAFFIC CONGESTION SHAPED PUBLIC DEBATE?

Here we explore congestion in terms of collective discourse and public priorities. Participant responses were mixed on this question, suggesting very significant variation in how traffic congestion can influence public debate and priorities in transportation planning. Indeed, while all respondents noted that traffic congestion has fostered increased debate, perspective differs greatly across the region.

A number of respondents indicated that regional traffic congestion has fostered additional support for transit and additional TDM measures, while helping the public recognize the limits to unrestrained growth in automobile use. This perspective is one that challenges the traditional transportation planning paradigm, and was characterized by one geographer in terms of a "language of sustainability". At the same time, other respondents argued congestion is fostering demand for more road capacity, and is in large part the driving force behind the Gateway Program. This perspective is consistent with the traditional transportation planning paradigm, and was characterized by one planner as a "language of utility". Table I provides an overview of the conflicting discourses at play within the region.

The senior TransLink official noted that traffic congestion has helped the regional transportation authority leverage additional funding and support for more transit infrastructure in the region, and stressed that it has been a very important factor on this front: "traffic congestion can be harnessed to create an appetite for, and recognition of, the economic value in investment in transportation alternatives". More specifically, congestion has helped create support for transportation demand management measures such as U-Pass for local university students, Employer Pass for employees of large organizations, and for investments such as high occupancy vehicle (HOV) lanes on Broadway³. Significantly, the official also noted that congestion might ultimately make people more ready to accept density in their neighborhoods, since "most people would rather have more people in their neighborhood than more traffic". This comment may suggest a growing level of understanding among

³ The U-Pass is a heavily discounted transit pass for students at the University of BC and Simon Fraser University. The pass is mandatory and has generated substantial increases in transit ridership since implementation in 2003. The Employer Pass program is a voluntary program that provides employees with an annual pass at a discounted rate. The City of Vancouver approved HOV lanes on Broadway in 2006 following years of lobbying by TransLink.

residents of the relationship between residential density and transportation choice, and the limitations of capacity expansion.

Perhaps more significantly, elected officials, professional planners, and representatives of business and industry associations agreed that congestion has helped the business community understand that capacity improvements alone will not solve the region's transportation problem. Comments from the TransLink official supported this view: "thinking in supply chains will need to be part of the solution, rather than thinking only about a capacity approach". Respondents suggested that industry and business interests in the region are beginning to think not just about increasing transport capacity in order to meet their needs, but also about how to maximize efficiency throughout their distribution system. In other words, congestion has helped illustrate to the business community the physical limitations of the road network, and has prompted some organizations to attempt to add value elsewhere.

Conversely, a number of respondents indicated that congestion does not help bring about a more rational debate on transportation; in fact, congestion can directly encourage the expansion of the road network. A suburban city councilor, the urban affairs journalist, and several transportation planners see congestion as an ongoing reminder that mobility within the region is limited. This reminder fosters demand for supply-side 'solutions' through road construction and expansion. More specifically, a large number of respondents indicated that congestion has made a compelling case for the Gateway Program and has created a residential population and business community willing to invest substantially in roads to alleviate congestion. For example, the leader of the regional real estate organization noted that in the absence of any other proposal, the provincial Gateway Program is the best solution on the table and deserves public support.

Respondents were asked to comment on the recent public dialogue on tolling—both as a demand management strategy and a cost recovery model—in order to assess how traffic congestion has been factored into the discussion. Clearly the politics of congestion are significant. According to one suburban mayor, "regional traffic congestion is the most important factor driving the dialogue around tolling". An urban mayor and the TransLink official argued that traffic congestion has fueled the debate on regional tolling, and pointed to the significance of the debate for future transportation policy considerations. Several transportation planners, an urban geographer, and a senior executive with a provincial trucking association

pointed to the increasing level of support for tolling as a demand management measure, especially among those with the urban core perspective. Conversely, a significant number of respondents noted the opposition to tolling that has emerged from the debate on traffic congestion. Again, opposition has been attributed largely to those with a suburban perspective.

Finally, perhaps ironically, one transportation consultant used the example of an American Sunbelt city, where "money is no object", to illustrate the potential for traffic congestion to shift the debate and ultimately serve as a catalyst for change toward sustainability. Phoenix is a congested, freeway-saturated city "where money is no object", yet the public has repeatedly rejected plans for rapid transit. However, public discourse and understanding has recently shifted, due largely to ongoing and worsening levels of traffic congestion: "most people have figured out that we simply cannot build enough freeways to handle the traffic". Frustration with the problem ultimately galvanized regional politicians and the public behind a new light rail transit (LRT) project. A twenty-mile LRT line is currently under construction, and an additional sixty miles is being planned. Traffic congestion has changed the debate in Phoenix, and "helped early adopters think more rationally about transportation supply", but at the same time, the LRT project is "never expressed in terms of the environment or sustainability". So while the region may have made a step in the direction of sustainability, it was more a function of utility than sustainability. Indeed, LRT is not perceived as the only solution: "some of the municipalities growing most rapidly on the west side of Phoenix are coming up with their own money to speed up transportation road building projects. It's incredible" (ibid.).

5. HOW DOES TRAFFIC CONGESTION BUILD SOCIAL CONSCIOUSNESS?

The data show the importance of social and cultural norms in shaping behavior. Several respondents noted how the conflict between the urban core and suburban municipalities is both reflected in, and shaped by, different cultural norms. These norms influence the use of transportation alternatives, because behavior is in part determined by one's peer group. Cultural norms evolve over time and, in the process, change perspective and behavior. For example, a large number of residents living in high-density condominiums and the growing popularity of car-sharing reflect shifting cultural norms and reinforce the behavior associated with more sustainable choices. As described by the urban affairs journalist:

Tableau I
Distinct regional discourses

	Toward Sustainability	Counter to Sustainability
Discourse	Language of sustainability – congestion is a limitation of auto-oriented systems	Language of utility – congestion is a regular reminder of restrictions on personal mobility
Transportation Planning Paradigm	Challenges the traditional paradigm by illustrating the flaw in planning primarily for the automobile	Reinforces the traditional transportation planning paradigm – congestion is a technical problem
Priorities	Transit projects, TDM measures, supply chain efficiency	Expansion of the road network – support for the Gateway Program
Tolling Debate	Some support for tolling as TDM	Opposition to tolling, or support as a funding mechanism only

I think in Vancouver, there is a cultural component to people's transportation choices. I really believe that people's behavior is in part shaped by what they see happening around them. There are people at work that bike or walk to work, and it makes you think, 'oh, they live as far away from work as I do, I could do that too'. Whereas out in the suburbs, you can have the exact same person with the exact same vague interests of saving the planet, but they're surrounded by people who are [saying] 'oh, they tell me to take the bus, but I have to get my kids here, and I have to be there, so what am I supposed to do?'

At the root of these conflicting and largely incompatible regional perspectives appear to be two distinct mental models, one of which is dominant in the urban core, the other in the surrounding suburbs. These models reflect among residents a divergence in understanding, attitudes, perception, and above all, social consciousness.

The mental model dominant in the urban core environment appears to see congestion as a limitation, and recognizes congestion as a flaw in auto oriented community design that can only be addressed through a wide range of measures, including demand management. In contrast, the mental model dominant in the suburban environment sees congestion as a problem that can be solved through road and highway expansion. As noted earlier, the data suggest suburban attitudes support methods to maximize traditional

ideas of efficiency, individual mobility and convenience, and can be characterized as based on a "language of utility". On the other hand, the data suggest that urban attitudes are more likely to support methods that address the collective benefit, and can be characterized as based on a 'language of sustainability'.

A number of respondents personalized this distinction by pointing to public figures within the region as reference points. At the "utility" end of the spectrum is Vancouver Sun columnist Pete McMartin, self-appointed representative of suburban commuters and frequent critic of public transit. McMartin encapsulates the very essence of the "language of utility" in his many columns on transportation issues, most of which describe his increasing frustration commuting to downtown Vancouver from his home South of the Fraser River. At the "sustainability" end of the debate is local urban planning consultant and lecturer Gordon Price. Price was a longtime Vancouver city councilor and is well known for his work as an advocate for cyclists and transit users. He is a vocal opponent of the Gateway Program and other projects intended to expand road capacity for the private automobile.

6. TWO DISTINCT AND CONFLICTING MENTAL MODELS

The data demonstrate that traffic congestion may serve as a catalyst for change toward sustainability in the urban core of Greater Vancouver. As argued by a

Tableau 2
Distinct mental models

	Urban Mental Model	Suburban Mental Model
Primary geographic area	Cities of Vancouver, North Vancouver, Burnaby, New West	Most other municipalities
Typical social norms	Mainstream use of a range of alternative transportation modes;	Very limited use of alternate modes
Degree of social consciousness	Highly developed	Less developed
Discourse	Language of sustainability	Language of utility
Typical resident type	Diverse: primarily singles or couples without kids, retirees, students, empty nesters,	More homogenous: typically young families with children
Transportation options	Wide range of alternatives, including transit, walking, cycling, car-sharing	Auto-oriented transportation system
Housing options	Mixed use housing, higher density housing, multiple housing types	Primarily single family detached homes
Land use	Medium to high-density, mixed use, pedestrian and transit oriented	Low density, single use, primarily auto-oriented

regional planner with Metro Vancouver, “congestion is not a major factor in terms of social consciousness or behavioral change in the region, except for core parts of the region where transportation alternatives exist”. However, it is not apparent that congestion is driving positive change in the suburbs. In fact, the data suggest that congestion is playing an entirely different role outside of the core—one that does not contribute to change toward sustainability.

As a catalyst for change, congestion is subject to certain key criteria: transportation choice, housing choice, and family structure. These elements are directly related to the nature of the environment in which people live and they generally differ between the region’s urban core and its suburbs. The analysis demonstrates the role of two conflicting mental models in the region, one of which is dominant in the

urban core, the other of which is dominant in the surrounding suburbs. These models account for wide variation in understanding, perception, attitudes, and social consciousness. Table 2 provides a summary of the key elements of the dominant mental models in the region.

Finally, while some people are beginning to make the connection between auto-oriented development, poor transportation alternatives, and traffic congestion, many are not. Data suggest a distinction between the public, as identified through profiles of resident categories in the region, and members of the professional, political and academic elite. Most of the transportation and land use planners interviewed argued that the public is not, for the most part, making the connection between traffic congestion and auto-oriented land use, though those who make decisions

in the region generally seem to understand the relationship. Conversely, one suburban transportation planner feels that elected officials have a lot to learn: "four of five politicians just don't get it".

CONCLUSION

The term 'sustainability' does not generally bring to mind traffic congestion, and it seems counter-intuitive to conceive of traffic congestion as a catalyst for change toward sustainability, particularly in light of the proposed Gateway Program. This article has found that traffic congestion is indeed a powerful force for change. Congestion can be a catalyst for change toward sustainability, but it can also be a catalyst for change that is not sustainable. The potential for change is subject to two distinct and incompatible mental models that shape perspectives, behavior, and social consciousness in the region. These models break down largely along urban and suburban boundaries, creating a major split in the region and significant variation in social consciousness.

In the David Suzuki Foundation's Sustainability within a Generation report, William Ruckelshaus, former head of the US Environmental Protection Agency, compares the scale of the sustainability agenda to the Industrial and Agricultural Revolutions. Moreover, he describes the need for sustainability to be a "fully conscious operation, guided by the best foresight that science can provide" (2004). Similarly, the literature on social change acknowledges the importance of consciousness to change and behavior modification. Indeed, Capra (1996), Meyer (2007), and Edwards (2005) argue that a common consciousness is necessary to build truly sustainable communities.

The future development of the region will depend on the level of social consciousness, and thus the mental model, of the dominant actors. Almost every respondent expressed a frustration with the (lack of) leadership being provided at the regional level. In fact, several respondents blamed poor leadership at the regional level for current transportation problems. Indeed, if the mental model dominant in the suburbs drives the regional agenda, then projects like Gateway will continue to be proposed as solutions to congestion. Many respondents indicated that the general public was ready for change, but needed strong regional leadership to leverage this support.

The challenge then, is to begin to bridge the gap between urban and suburban, in part by addressing the root causes of congestion, ultimately through an alternative to the traditional suburban development

pattern. No other lifestyle choice has captured the hearts and imaginations of North Americans (or created transportation problems) quite like the suburban ideal. Changing the suburban ideal is one of the most important challenges of change toward sustainability, and one that will require a wholesale shift in how society thinks about regional travel and transportation.

The data showed a significant divergence in social consciousness throughout the region, suggesting two very different mental models at work within the urban and suburban parts of Greater Vancouver. Additional research is needed to further develop the mental model framework at a local or neighbourhood level within the Greater Vancouver region, and to understand the impact of higher density 'urban' development on the suburban mental model. Future research may seek to identify and explore variations in the urban / suburban divide.

Finally, additional research is needed to determine the applicability of this article's conclusions to other metropolitan regions. Future research may consider a multiple case study approach to assess the mental models dominant in other regions. By evaluating a number of cases, it may be possible to assess the importance of factors specific to the Vancouver region, such as a history of progressive planning and a significant level of social consciousness. Finally as data become available, it may be possible to assess the relationship between specific levels of traffic congestion and different mental models.

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